20030104608. 09 Mar 93. 05 Jun 03. METHOD, COMPOSITION AND DEVICE FOR REMOVING OXYGEN FROM SOLUTIONS CONTAINING ALCOHOLS AND/OR ACIDS. COPELAND, JAMES C., et al. 435/262; C07C001/00.

☐ 2. 20020045245. 19 Mar 01. 18 Apr 02. Apparatus and method for growing anaerobic microorganisms. Copeland, James C., et al. 435/305.3; 435/303.2 C12M001/22.

☐ 3. 6429008. 19 Mar 01; 06 Aug 02. Apparatus and method for growing anaerobic microorganisms. Copeland; James C., et al. 435/303.2; 422/102 435/305.4 435/307.1 435/801. C12M001/00.

☐ 4. 6204051. 28 May 99; 20 Mar 01. Apparatus and method for growing anaerobic microorganisms. Copeland; James C., et al. 435/305.4; 435/288.3 435/303.2 435/801. C12M001/22.

☐ 5. 5955344. 03 Nov 97; 21 Sep 99. Apparatus and method for growing anaerobic microorganisms. Copeland; James C., et al. 435/243; 435/288.3 435/303.2 435/305.4 435/307.1 435/395 435/420 435/801. C12N001/00.

☐ 6. 5830746. 04 May 94; 03 Nov 98. Apparatus and method for growing anaerobic microorganisms. Copeland; James C., et al. 435/243; 435/303.2 435/305.4. C12M001/00.

☐ 7. 5482860. 20 Apr 93; 09 Jan 96. Apparatus for continuously removing oxygen from fluid streams. Copeland; James C., et al. 435/293.1; 435/297.1 435/813. C12M001/40.

☐ 8. 5432083. 19 Feb 93; 11 Jul 95. Enzymatic method for removing oxygen from oils and fats. Copeland; James C., et al. 435/271; 426/417 426/601 435/262 435/317.1. C12S003/00 C11C001/00 C12N001/00 A23L003/3463.

☐ 9. 5240853. 07 Mar 89; 31 Aug 93. Apparatus and method for continuously removing oxygen from fluid streams using bacterial membranes. Copeland; James C., et al. 435/262; 435/820. C12N011/18.

☐ 10. 4996073. 29 Aug 89; 26 Feb 91. Method and composition for removing oxygen from solutions containing alcohols and/or acids. Copeland; James C., et al. 426/487; 426/541 426/544 426/592 435/161 435/262 435/264 435/801 435/820. C12G001/00 C12H001/00.

☐ 11. WO009530738A1. 04 May 95. 16 Nov 95. APPARATUS AND METHOD FOR GROWING ANAEROBIC MICROORGANISMS. COPELAND, JAMES C, et al. C12M001/00; C12M001/16 C12M001/18 C12M001/20.

☐ 12. WO008804319A1. 04 Dec 87. 16 Jun 88. MATERIAL AND METHOD FOR PROMOTING GROWTH OF ANAEROBIC BACTERIA. ADLER, HOWARD I, et al. 435/253.6. C12N001/20; C12N001/00.

☐ 13. US 6429008B. Culture dish assembly for growing anaerobic microorganisms, comprises first and second dishes having wall and side wall. ADLER, H I, et al. C12M001/00 C12M001/22.

☐ 14. US 6204051B. Culture dish assembly for automated preparation of e.g. agar, necessary for commercial production, includes dishes that form non-sealed assembly in first orientation and closed headspace in second orientation. ADLER, H I, et al. C12M001/22.

☐ 15. US 5830746A. Appts. for growing anaerobic microorganisms - with top and bottom dish and

intervening sealing ring contacting media surface on inversion of appts. to trap anaerobic gas in head-space. ADLER, H I, et al. C12M001/00 C12M001/16 C12M001/18 C12M001/20 C12M001/22 C12N001/00.

☐ 16. WO 8804319A. Nutrient medium for promoting growth of anaerobic bacteria - includes a hydrogen donor and sterile membrane fragments derived from mitochondria having membranes contg. electron transfer system. ADLER, H I, et al. C12N001/20.

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Term	Documents
(43 NOT 42).PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	16
(L43 NOT L42).PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	16

Prev Page Next Page Go to Doc#

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(30) Priority Data:
08/237,773 4 May 1994 (04.05.94) US

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With international search report.

(54) Title: APPARATUS AND METHOD FOR GROWING ANAEROBIC MICROORGANISMS

(57) Abstract

An apparatus for growing anaerobic microorganisms is provided having a dish top that contains a sealing ring upon which the media surface in the dish bottom rests when the apparatus is inverted. The contact between the sealing ring and the media surface forms a seal that traps the gas in the headspace between the media surface and the inside of the dish top. An oxygen reducing agent can also be incorporated into the media together, in some instances, with a substrate which react with oxygen in the media and with oxygen in the headspace thereby creating an environment suitable for growing anaerobic, microaerophilic and facultative anaerobic microorganisms.

L32: Entry 3 of 8 File: PGPB Apr 18, 2002

DOCUMENT-IDENTIFIER: US 20020045245 A1
TITLE: Apparatus and method for growing anaerobic microorganisms

Summary of Invention Paragraph:
[0003] The present invention relates to an apparatus and method for growing anaerobic microorganisms. The apparatus is comprised of a specially designed culture dish which can be reconfigured such as by inverting the dish to produce an anaerobic environment. An oxygen reducing agent such as a biocatalytic oxygen reducing agent can also be incorporated into the media present in the apparatus together, in some circumstances, with a substrate. The biocatalytic oxygen reducing agent and the substrate present in the media react with oxygen enclosed in the culture dish to create an environment suitable for growing and maintaining anaerobic microorganisms.

Summary of Invention Paragraph:
[0027] The present inventors have designed a novel culture apparatus or dish in order to eliminate many of the difficulties observed in the prior art. It has been found that the use of the new culture dish (i.e., "OxyDish.TM.") together with an oxygen reducing agent (preferably a biocatalytic oxygen reducing agent) and, in some instances, a substrate, produces a controlled, self-contained environment for isolating, enumerating, identifying and growing facultative aerobes, microaerophiles and anaerobes. The use of the specially designed culture dish along with an oxygen reducing agent makes possible the design and function of a culture dish that utilizes some features of the Brewer Lid, but overcomes its limitations and makes possible novel and improved characteristics.

Summary of Invention Paragraph:
[0028] In this regard, the present invention is directed to a specifically designed culture dish with a dish top or cover that contains a sealing Sing on the inside upon which the solid media surface in the bottom dish rests when the dish is inverted to form a media-ring seal. The seal so formed traps the gas in the headspace between the media surface and the inside of the dish top or cover. In addition, an oxygen reducing agent, such as a biocatalytic oxygen reducing agent, can be incorporated into the media present in the culture dish together, in some instances, with a substrate which reacts with oxygen in the media and the headspace to create an environment suitable for growing anaerobic microorganisms.

Summary of Invention Paragraph:
[0029] The preferred biocatalytic oxygen reducing agent (see "A Novel Approach to the Growth of Anaerobic Microorganisms" of Adler, et al., Biotechnol. Bioegn. Symp. 11, J. Wiley & Sons, New York, 1981, p. 533 and U.S. Pat. No. 4,476,224 issued Oct. 9, 1984 to Adler entitled "Material and Method for Promoting the Growth of Anaerobic Bacteria") utilized in the invention is comprised of oxygen scavenging membrane fragments which contain an electron transport system which reduces oxygen to water in the presence of a hydrogen donor. These oxygen scavenging membrane fragments can be derived from the cytoplasmic membranes of bacteria (U.S. Pat. No. 4,476,224) and/or from the membranes of mitochondrial organelles of a large number of higher non-bacterial organisms. Other known biocatalytic oxygen reducing agents such as glucose oxidase, alcohol oxidase, etc. can also be utilized.

L13: Entry 63 of 64 File: USPT Nov 8, 1983

DOCUMENT-IDENTIFIER: US 4414334 A
TITLE: Oxygen scavenging with enzymes

Brief Summary Text (24):
As a catalyst, the enzyme is not consumed but functions continuously as long as oxygen and aqueous alcohol are both present. It is noteworthy that reaction ceases if ambient oxygen is depleted but is resumed if more oxygen is introduced into the system. Therefore, additional oxygen is continuously removed and the enzymes, unlike conventional oxygen scavengers, are not used up. Thus only a relatively small amount of enzyme is required to catalyze the removal of a relatively large amount of oxygen from aqueous alcohol mixtures.

Brief Summary Text (27):
In applications where the H.sub.2 O.sub.2 by-product is preferred such as in selected drilling muds, the purified alcohol oxidase is used. The generated H.sub.2 O.sub.2, e.g., can react with the carboxymethylcellulose or starch in drilling muds to improve the product. Another use of the purified alcohol oxidase is in waterfloods wherein the by-product H.sub.2 O.sub.2 functions as a biocide against downhole anaerobic microorganisms. In such applications a dual biocidal effect would be produced from the alcohol added, e.g., CH.sub.3 OH, and the by-product H.sub.2 O.sub.2 generated in-situ. The further injection of O.sub.2 downhole to produce more H.sub.2 O.sub.2 in-situ would provide additional biocidal effects.

Brief Summary Text (32):
Thus, the inventive deoxygenation systems are useful in decreasing or preventing the corrosion of corrosion-susceptible metals, particularly iron, which are in contact with closed circulating oxygen-containing water systems such as those passing through condensers, engine jackets, heat exchangers, evaporators, distribution systems, and the like as well as water storage tanks. The oxygen-scavenging systems thus help to avoid corrosion of metals commonly used in circulating water systems particularly ferrous metals including iron and steel, and also galvanized steel as well as non-ferrous metals including copper and its alloys, aluminum and its alloys, and brass. Of course, on a practical basis, it is not feasible to deoxygenate a cooling tower or evaporative condenser water due to constant re-saturation with air (oxygen).

Detailed Description Text (18):
The net effect of the reactions catalyzed by the enzyme combination of alcohol oxidase and catalase is the effective scavenging of free oxygen and the conversion of the by-product H.sub.2 O.sub.2 into water.

Detailed Description Text (21):
The enzyme-catalyzed deoxygenation systems described herein are operable over a pH range of 6 to 9 with an optimum pH range of 6.5 to 7.5. A temperature range of 0.degree. to 60.degree. C. is suitable with an optimum temperature range of about 40.degree. to 50.degree. C. The enzyme preparations can be stored indefinitely at 0.degree. C. without any appreciable loss of activity. The catalytic enzymes of the subject deoxygenation systems are active over a salinity range of 500 ppm total dissolved solids (TDS) to about 300,000 ppm TDS. In regard to stabilizers, 100 to 500 ppm formaldehyde or about 0.02 weight percent sodium azide is effective in

maintaining a high level of enzyme activity in solution within the designated ranges of pH and temperature.

Detailed Description Text (42):
At the end of dialysis, the alcohol oxidase is present in the dialysis bag as a crystalline solid. The crystalline alcohol oxidase can be readily separated from the dialysis medium, such as by decanting the liquid in the dialysis bag from the solid crystals. The moist crystals can be further processed as desired for storage. For example, the crystal slurry can be frozen followed by lyophilization to form a dry powder, or can be dissolved in water or more preferably in a phosphate buffer. The alcohol oxidase can be stored frozen without significant loss of enzymatic activity. Stabilizer compounds known to stabilize enzyme solutions against denaturation and loss of enzymatic activity can be added, such as sucrose or glycerol, or 0.02 weight % sodium azide.

Detailed Description Text (43):
It is suitable to store the prepared enzyme at temperatures in the range of about 4.degree. C. to 40.degree. C., preferably about 4.degree. C. to 24.degree. C. and most preferably at about 4.degree. C. Only minimal loss of activity occurs on storage of the enzyme at 4.degree. C. in 0.1 M phosphate buffer at pH 7.5, and with such as about 0.02% sodium azide to inhibit microorganism growth.

Detailed Description Text (46):
The alcohol oxidase isolated from Pichia-type microorganisms is typified by the alcohol oxidase isolated from Pichia pastoris. The "Pichia"-derived alcohol oxidase is homogeneous as judged by sodium dodecyl sulfate (SDS) gel electrophoresis. The alcohol oxidase enzyme is estimated to comprise 6 or more subunits, of an estimated molecular weight of 72,000 per subunit as estimated by SDS gel electrophoresis and an estimate of the molecular weight of the alcohol oxidase. The enzyme is a flavoprotein having FAD (flavin adenine dinucleotide) as a coenzyme comprising about one FAD moiety per enzyme subunit. The apparent Michaelis constant, Km, for methanol is about 4 mM. Electrophoretic analysis suggests that the molecular weight of the Pichia enzyme is larger than that of an alcohol oxidase isolated from Candida boidinii. The Pichia enzyme differs from an alcohol oxidase isolated from Hansenula polymorpha in the extent to which it binds sodium azide, and in its ability to form crystals in 0.02 M sodium phosphate at pH 6.5.

Detailed Description Text (67):
Although sodium hydrosulfite (Flask No. 1) is a recognized oxygen scavenger in the art, poor results were obtained under the conditions of the above runs. Apparently, free radical species produced by the interaction of oxygen and hydrosulfite in the presence of polyacrylamide presumably attack the polymer giving rise to chain scission of the polymer to lower molecular weight fragments and the observed decrease in solubtion viscosity. If all the oxygen is scavenged from the water by hydrosulfite before adding the polymer and the resulting polymer solution is protected from further contact with oxygen, e.g., by storage in a sealed glass capillary viscometer, the solution viscosity was observed to be constant over a period of 100 days. In Flask No. 2, the thiourea perhaps functions as a free radical trap which moderates the proposed polymer scission discussed above and thereby more effectively stabilizes the solution viscosity.

Detailed Description Text (68):
The absence of polymer chain scission (Flask No. 5) during the oxygen scavenging reaction of the alcohol oxidase/methanol system is reflected in the relatively constant solution viscosity over the 144 hour test period. Referring to FIG. 1, it is observed that a 500 ppm aqueous polyacrylamide solution (Hercules NH 335 polyacrylamide) treated with 0.6 Eu/mL alcohol oxidase with 500 ppm methanol exhibited a viscosity of about 40 cp at 75.degree. F. over a period of twenty hours whereas the same aqueous polyacrylamide solution under similar reaction conditions containing hydrosulfite exhibited a viscosity decrease to about 10 centipoises over

a 20 hour period.

Detailed Description Text (70):
The alcohol oxidase system continues to scavenge oxygen effectively if the polymer solution is recontacted with oxygen. The alcohol oxidase-methanol system preferably also with catalase can be used in combination with the hydrosulfite system if desired to provide viscosity-stabilized aqueous fluids.

Previous Doc Next Doc Go to Doc#

WEST Search History

Hide Items | Restore | Clear | Cancel

DATE: Tuesday, October 25, 2005

Hide?	Set Name	Query	Hit Count
	DB=USPT; PLUR=YES; OP=OR		
☐	L1	4808517.pn.	1
☐	L2	L1 and particles	1
☐	L3	L1 and (coli or bacteria or prokaryote or procaryote or escherichia)	1
☐	L4	media or medium	768111
☐	L5	L4 and azide	18300
☐	L6	L5 and $membrane	8186
☐	L7	L6 and (anaerobic$ or anaerobe or facultative$)	294
☐	L8	l4.clm.	215664
☐	L9	L8 and $azide.clm.	406
☐	L10	L9 and membrane.clm.	20
	DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=OR		
☐	L11	oxygen near5 scaven$	7509
☐	L12	L11 and (facultat$ or anaerobe or anerob$ or anaerob$)	459
☐	L13	L12 and ($azide or $cyanide)	64
☐	L14	($oxidase same $azide)	1684
☐	L15	L14 and (oxydish$ or oxy-dish$ or oxyrase$ or anaerobe or anaerob$ or facultative$)	77
☐	L16	L15 not l13	75
☐	L17	anaerob$ near5 (growth or growing or media or medium or cultur$)	6003
☐	L18	L17 and oxyrase$	37
☐	L19	L18 and (cyanide or azide)	6
☐	L20	membran$ near5 (n3 or azide)	132
☐	L21	L20 and (oxyrase or oxydish$ or oxidase)	15
☐	L22	nan$1 and oxyrase	0
☐	L23	nan3 and oxyrase	0
☐	L24	nan3 and oxydish	0
☐	L25	oxydish or oxyrase or oxidase	39619
☐	L26	L25 same (cyanide or cn or nan3 or nan or azide or naazide or na-azide)	1350
☐	L27	L26 same(media or medium or growth or growing or isolation or isolating or subculturing or sub-culture)	194
		L26 same (media or medium or growth or growing or isolation or isolating or	

☐	L28	subculturing or sub-culture)	194
☐	L29	l28 same (anaerobe or anaerobic or anerobically or anerobic or anerobe or anerobically or facultatively or facultative)	21
☐	L30	anaerob$ near2 growth near2 (media or medium)	101
☐	L31	L30 and azide	5
☐	L32	biocatalytic near oxygen	8
☐	L33	electron near transport near inhibitor	79
☐	L34	L33 same l11	2
☐	L35	L33 and azide	32
☐	L36	L33 and oxyrase	2
☐	L37	L33 and oxydish	0
☐	L38	L33 and l25	44
☐	L39	L33 same l25	5
☐	L40	L39 same l11	0
☐	L41	L39 and l11	1
☐	L42	copeland.in. and azide	4
☐	L43	copeland.in. and anaerob$	20
☐	L44	L43 not l42	16

END OF SEARCH HISTORY

#25 Search **anaerobic cyanide culture**	14:30:15	
#24 Search **anaerobic cyanide**	14:30:07	4
#23 Search **anoxic broth cyanide**	14:29:13	
#22 Search **anoxic broth azide**	14:29:02	
#19 Search **oxygen scavenging azide**	14:26:53	
#18 Search **oxygen scavaging azide**	14:26:51	
#17 Search **oxygen scavaging azide growth medium**	14:26:46	
#15 Search **oxidase azide growth medium**	14:24:15	
#13 Search **oxidase azide media**	14:23:28	
#7 Search **oxidase azide anoxic**	14:17:26	
#6 Search **oxidase azide**	14:17:18	21
#4 Search **oxyplate**	13:32:55	
#2 Search **anaselect**	13:32:48	
#3 Search **anas elect**	13:32:38	1
#1 Search **anaselect azide**	13:31:58	109

Clear History

First Hit Fwd Refs Previous Doc Next Doc Go to Doc#

Generate Collection Print

L13: Entry 56 of 64 File: USPT May 27, 1997

DOCUMENT-IDENTIFIER: US 5633165 A
TITLE: Fermentor with vertical shaft

Detailed Description Text (50):
All bacteria, including both archaebacteria and eubacteria, generally have more than one terminal oxidase (Anraku and Gennis, supra), and thus all except obligate anaerobes are potentially susceptible to DO.sub.2 instabilities upon culturing. Suitable bacteria for this purpose include aerobic and facultative anaerobic bacteria, whether archaebacteria and eubacteria, especially eubacteria, and most preferably Enterobacteriaceae. Examples of useful bacteria include Escherichia, Enterobacter, Azotobacter, Erwinia, Bacillus, Pseudomonas, Klebsiella, Proteus, Salmonella, Serratia, Shigella, Rhizobia, Vitreoscilla, and Paracoccus. Suitable E. coli hosts include E. coli W3110 (ATCC 27,325), E. coli 294 (ATCC 31,446), E. coli B, and E. coli X1776 (ATCC 31,537). These examples are illustrative rather than limiting. Mutant cells of any of the above-mentioned bacteria may also be employed. It is, of course, necessary to select the appropriate bacteria taking into consideration replicabilityof the replicon in the cells of a bacterium. For example, E. coli, Serratia, or Salmonella species can be suitably used as the host when well known plasmids such as pBR322, pBR325, pACYA177, or pKN410 are used to supply the replicon.

Detailed Description Text (68):
It has been found herein that when the organism has previously been induced for the presence of menaquinone and the cytochrome d oxidass complex, it has the ability to scavenge low concentrations of oxygen but does so inefficiently. When sufficient oxygen is present, it would appear that this inefficient pathway is not allowed to function.

Other Reference Publication (20):
Doelle and Hollywood, "Transitional Steady-State Investigations during Aerobic-Anaerobic Transition of Glucose Utilization by Escherichia coli K-12" European Journal of Biochemistry 83:479-484 (1978).

Other Reference Publication (32):
Harrison and Loveless, "The Effect of Growth Conditions on Respiratory Activity and Growth Efficiency in Facultative Anaerobes Grown in Chemostat Culture" J. Gen. Microbiology 68:35-43 (1971).

Other Reference Publication (71):
Tamura-Lis and Webster, "Cyanide- and Carbon Monoxide-Resistant Mutants of Vitreoscilla: Altered Cytochromes and Respiratory Properties" Arch. Biochem. and Biophys. 244(1):285-291 (1986).

Other Reference Publication (72):
Tamura-Lis and Webster, "Respiration in Carbon Monoxide and Cyanide Resistant Strains of Vittreoscilla" Fed. Proc. (Ab. #2799) 41(3):749 (1982).

Previous Doc Next Doc Go to Doc#

Previous Doc Next Doc Go to Doc#
First Hit Fwd Refs

Generate Collection

L31: Entry 2 of 5 File: USPT Jan 22, 1991

DOCUMENT-IDENTIFIER: US 4987076 A
TITLE: Uricase and a method for the preparation thereof

Detailed Description Text (49):
14. Growth in anaerobic culture medium: no

Detailed Description Text (51):
16. Growth at 55.degree. C. in a culture medium containing 0.02% sodium azide: no

Detailed Description Text (60):
As a result of the examination undertaken according to the method of classification described in Bergey's Manual of Determinative Bacteriology, 8th edition (1974) making reference to the above mentioned bacteriological properties of the microorganism, the subject microorganism of TB-90 was identified to belong to the genus of Bacillus. Although it may be a tentative conclusion derived from the comparison with known species belonging to the genus of Bacillus that the above described TB-90 can be either of Bacillus stearothermophilus, Bacillus coagulans and Bacillus brevis in respect of the temperature range for growth, this tentative conclusion is not supported due to the lack of motility in TB-90. Moreover, TB-90 can be differentiated from Bacillus stearothermophilus in respect of the ability of growth in a Sabouraud dextrose agar culture medium, from Bacillus coagulans in respect of the inability of growth in an anaerobic agar culture medium and in the presence of 0.02% of sodium azide and from Bacillus brevis in respect of the production of acid from xylose, no production of alkali in a V-P culture medium and inability of decomposing casein and tyrosine. In addition, uricase could not be produced when the culturing procedure described below was undertaken of the type strains including Bacillus stearothermophilus IAM 11001, 11002, 11003, 11004 and 12043, Bacillus coagulans IAM 1194 and Bacillus brevis IAM 1031 deposited at Institute of Applied Microbiology of Tokyo University.

Previous Doc Next Doc Go to Doc#

L32: Entry 1 of 8 File: PGPB Jun 16, 2005

DOCUMENT-IDENTIFIER: US 20050130252 A1
TITLE: Stabilized susceptibility tests of aerobic pathogens

Detail Description Paragraph:
[0032] Adjuvant means a substance which enhances the effectiveness of medical treatment and further means a substance that may or may not have antimicrobial activity in and of itself, but in combination with an antibiotic in a sufficient amount, acts to stabilize and enhance susceptibility testing. Adjuvants include those selected from the group cysteine, thioglycolate, ascorbic acid, pyruvate and catalase. The methods and compositions described herein also include the use of adjuvants derived from the cytoplasmic membranes of microorganisms such as E. coli which act as stabilizing agents. OXYRASE.RTM. is the trademark for the cytoplasmic membranes of microorganisms such as E. coli marketed by Oxyrase, Mansfield, Ohio 44901, further known herein as Oxyrase.RTM. or Oxyrase.RTM. Enzyme System. Osyrase.RTM. is also known as a biocatalytic oxygen reducing agent. Further, the adjuvants which are oxygen reducing agents and those that are derived from the cytoplasmic membranes of microorganisms such as E. coli which contains oxygen scavenging membrane fragments, can be used alone or in combination with other adjuvants.

Detail Description Paragraph:
[0066] The preferred Oxyrase.RTM. enzyme system utilized as an adjuvant in the invention is comprised of oxygen scavenging membrane fragments which contain an electron transport system which reduces oxygen to water in the presence of a hydrogen donor. These oxygen scavenging membrane fragments can be derived from the cytoplasmic membranes of bacteria and/or from the membranes of mitochondrial organelles of a large number of higher non-bacterial organisms. Other known biocatalytic oxygen reducing agents such as glucose oxidase, alcohol oxidase, catalase, etc. can also be supplemented or utilized in the present invention, although generally less preferably.

First Hit Previous Doc Next Doc Go to Doc#

Generate Collection Print

L32: Entry 1 of 8 File: PGPB Jun 16, 2005

DOCUMENT-IDENTIFIER: US 20050130252 A1
TITLE: Stabilized susceptibility tests of aerobic pathogens

Detail Description Paragraph:
[0032] Adjuvant means a substance which enhances the effectiveness of medical treatment and further means a substance that may or may not have antimicrobial activity in and of itself, but in combination with an antibiotic in a sufficient amount, acts to stabilize and enhance susceptibility testing. Adjuvants include those selected from the group cysteine, thioglycolate, ascorbic acid, pyruvate and catalase. The methods and compositions described herein also include the use of adjuvants derived from the cytoplasmic membranes of microorganisms such as E. coli which act as stabilizing agents. OXYRASE.RTM. is the trademark for the cytoplasmic membranes of microorganisms such as E. coli marketed by Oxyrase, Mansfield, Ohio 44901, further known herein as Oxyrase.RTM. or Oxyrase.RTM. Enzyme System. Osyrase.RTM. is also known as a biocatalytic oxygen reducing agent. Further, the adjuvants which are oxygen reducing agents and those that are derived from the cytoplasmic membranes of microorganisms such as E. coli which contains oxygen scavenging membrane fragments, can be used alone or in combination with other adjuvants.

Detail Description Paragraph:
[0066] The preferred Oxyrase.RTM. enzyme system utilized as an adjuvant in the invention is comprised of oxygen scavenging membrane fragments which contain an electron transport system which reduces oxygen to water in the presence of a hydrogen donor. These oxygen scavenging membrane fragments can be derived from the cytoplasmic membranes of bacteria and/or from the membranes of mitochondrial organelles of a large number of higher non-bacterial organisms. Other known biocatalytic oxygen reducing agents such as glucose oxidase, alcohol oxidase, catalase, etc. can also be supplemented or utilized in the present invention, although generally less preferably.

Previous Doc Next Doc Go to Doc#

US PGPub-20020045248 A1

Summary of Invention Paragraph:
[0030] The biocatalytic oxygen reducing agents suitable for use in the invention are non-toxic to microorganisms. Being catalysts, they are dynamic and highly efficient at reducing the oxygen in the trapped headspace in the specially designed culture dish. The biocatalytic oxygen

Summary of Invention Paragraph:
[0031] In this regard, the present invention is directed to a specifically designed culture dish with a dish top or cover that contains a sealing ring on the inside upon which the solid media surface in the bottom dish rests when the dish is inverted to form a media-ring seal. The seal so formed traps the gas in the headspace between the media surface and the inside of the dish top or cover. In addition, an oxygen reducing agent, such as a biocatalytic oxygen reducing agent, can be incorporated into the media present in the culture dish together, in some instances, with a substrate which reacts with oxygen in the media and the headspace to create an environment suitable for growing anaerobic microorganisms.

Summary of Invention Paragraph:
[0032] The preferred biocatalytic oxygen reducing agent (see "A Novel Approach to the Growth of Anaerobic Microorganisms" of Adler, et al., Biotechnol. Bioegn. Symp. 11 J. Wiley & Sons, New York, 1981, p. 533 and U.S. Pat. No. 4,476,224 issued Oct. 9, 1984 to Adler entitled "Material and Method for Promoting the Growth of Anaerobic Bacteria") utilized in the invention is comprised of oxygen scavenging membrane fragments which contain an electron transport system which reduces oxygen to water in the presence of a hydrogen donor. These oxygen scavenging membrane fragments can be derived from the cytoplasmic membranes of bacteria (U.S. Pat. No. 4,476,224) and/or from the membranes of mitochondrial organelles of a large number of higher non-bacterial organisms. Other known biocatalytic oxygen reducing agents such as glucose oxidase, alcohol oxidase, etc. can also be utilized.

Summary of Invention Paragraph:
[0033] The biocatalytic oxygen reducing agents suitable for use in the invention are non-toxic to microorganisms. Being catalysts, they are dynamic and highly efficient at reducing the oxygen in the trapped headspace in the specially designed culture dish. The biocatalytic oxygen reducing agents use substrates that are commonly found in microbiological media and that are natural to microorganisms to effect this reaction. The products produced from this reaction are also natural and non-toxic to microorganisms. The use of the biocatalytic oxygen reducing agents makes possible the opening and closing of this dish several times and the agents continue to reduce the oxygen trapped in the headspace after each occurrence.

Summary of Invention Paragraph:
[0037] Furthermore, when the culture dish is utilized with the oxygen reducing agent such as a biocatalytic oxygen reducing agent, the oxygen reducing agent in the media reacts with the oxygen trapped in that headspace. This reaction renders the headspace sufficiently low in oxygen such that microorganisms affected by the presence of oxygen can grow on the media surface typically within 24 to 48 hours when the dish is incubated at 35.degree. C. to 37.degree. C. in an aerobic incubator. Any oxygen that intrudes into the dish around the media ring-seal or through the plastic is removed by the action of the reducing agent. The catalytic reducing agent facilitates the design and function of this dish.

Detail Description Paragraph:
[0082] A variant of the culture dish contains one or more perforations or pores 132 in the dish bottom 12 for the purpose of controlling moisture inside the headspace 80. The sizes of the pores 132 can vary but are usually about one-tenth (0.1) cm to three-tenths (0.3) cm in diameter. The number of pores 132 can vary from one (1) to eighty (80) or more and their location can be grouped or evenly spaced. The pores may be covered with an adhesive film (not shown) such as Mylar.TM. which retards the passage of oxygen and can be sterilized in place when the dish is sterilized.

This film can be removed after the culture dish 10 is filled and before it is incubated. The pores provide a means to reduce the water content of the media during incubation in a controlled manner. This reduces the condensate that forms inside the assembled culture dish 10. Any oxygen infiltrating into the assembled culture dish 10 through these pores 132 must pass through the media 14 to get to the media surface where the microbes 20 are planted. The media 14 contains the biocatalytic oxygen reducing agent and optionally one or more substrates that removes the oxygen before it can reach the surface by this route.

Detail Description Paragraph:
[0095] The biocatalytic oxygen reducing agents suitable for use in the invention include known biocatalytic oxygen reducing agents such as glucose oxidase and catalase and the oxygen scavenging bacterial cell membrane fragments disclosed in U.S. Pat. No. 4,476,224 entitled "Material and Method for Promoting the Growth of Anaerobic Bacteria", issued Oct. 9, 1984 to Howard I. Adler, Oak Ridge, Tenn., one of the co-inventors of the present invention. The '224 patent is incorporated herein by reference.

Detail Description Paragraph:
Growth of Anaerobic Microorganisms Using the Culture Dish, i.e., "OxyDish.TM." of the Present Invention and a Biocatalytic Oxygen Reducing Agent

Detail Description Paragraph:
[0113] Nutrient agar is supplemented with sodium formate (15 mM), sodium succinate (30 mM), sodium lactate (45 mM) and cysteine (0.025 g/100 ml). A biocatalytic oxygen reducing agent, EC-Oxyrase.RTM. (Oxyrase, Inc., Mansfield, Ohio) is added to cooled (45.degree. C. to 50.degree. C.) but molten sterile medium to give a final concentration of 5 units/ml. 20 ml of the above mixture is soon introduced into the bottom part of a culture dish, i.e., "OxyDish.TM.". The top part of the culture dish, is placed over the filled bottom part to prevent contaminants from entering the dish. The agar in the bottom part cools to ambient temperature and solidifies. The covered dish is left standing to permit excess moisture to escape. At this point the dish may be sealed by inverting it to bring the agar surface in the dish bottom into contact with the ring inside the dish top.

Detail Description Paragraph:
[0114] A suspension of anaerobic microorganisms is spread on the surface of the agar medium that contains the biocatalytic oxygen reducing agent and its substrates. The dish is sealed by inverting it. The dish is then placed into an aerobic incubator at 35.degree. C. to 37.degree. C. for 24 to 48 hours. Several dishes are stacked to form a stable column of dishes.

Detail Description Paragraph:
[0116] Using this technique with the culture dish, i.e., "OxyDish.TM." and a biocatalytic oxygen reducing agent, the following microorganisms have been grown:

Detail Description Paragraph:
Measurement of Oxygen Depletion in the Headspace of the Culture Dish Effect of the Present Invention by the Biocatalytic Oxygen Reducing Agent

Detail Description Paragraph:
[0118] A hole is drilled in the base of the culture dish, i.e., "OxyDish.TM." and a gas tight septum is inserted. The base is then filled with 20 ml of agar containing a biocatalytic oxygen reducing agent. The bottom is sealed to the top by inverting the assembled dish and incubating it at 37.degree. C. Periodically, 50 ul samples of the gas in the headspace of the dish are sampled by inserting the tip of a 100 ul gas tight Hamilton syringe through the septum in the base of the dish. These samples are introduced into an Oxygen Sensor (IT Corporation) and the concentration of oxygen remaining in the headspace is determined. Using this method it has been determined that all measurable oxygen, less than 10 pp billion, is removed from the

head space in two to eight hours depending on the concentration and configuration of the biocatalytic agent used. It has also been determined that the dish can be opened, resealed and, after a suitable incubation period, the head space again becomes anaerobic.

Detail Description Paragraph:
Rapid Anaerobiosis of the Agar Layer Containing a Biocatalytic Oxygen Reducing Agent as Indicated by Methylene Blue.

Detail Description Paragraph:
[0121] A small rectangular piece of filter paper impregnated with methylene blue at an alkaline pH is fixed to the inside of the dome in the top of the culture dish, i.e., "OxyDish.TM.". The dish bottom contains nutrient agar and a biocatalytic oxygen reducing agent. The dish is sealed by inverting it thereby causing the agar surface to rest on the ring. After incubation at 37.degree. C. for 8 hours or more, the blue color disappears from the filter paper. This indicates that the headspace of the culture dish, i.e., "OxyDish.TM." has become anaerobic.

Detail Description Paragraph:
Use of Glucose Oxidase and Catalase as the Biocatalytic Oxygen Reducing Agent

Detail Description Paragraph:
[0123] A piece of filter paper saturated with a 1% sodium bicarbonate solution and then dried is fixed to the inside of the dome in the culture dish, i.e., "OxyDish.TM." top. This filter paper is then covered by a 0.2 u membrane filter. The dish bottom is filled with 20 ml of Nutrient Agar (Difco) and a biocatalytic oxygen reducing agent, EC-Oxyrase.RTM. at 5 units/ml and substrates. The agar surface is inoculated by streaking with a small amount of Clostridium acetobutylicum, a microorganism that requires CO.sub.2 for rapid colony development. Immediately before sealing the dish, one drop of 0.1 N HCl is placed on the membrane filter. The dish is sealed by inverting it and placed into a 37.degree. C. aerobic incubator. After 24 hours of incubation, growth of C. acetobutylicum can be observed indicating that CO.sub.2 was released from the sodium bicarbonate impregnated filter paper into the headspace of the culture dish, i.e., "OxyDish.TM.".

Previous Doc Next Doc Go to Doc#

L13: Entry 47 of 64 File: USPT Jul 31, 2001

DOCUMENT-IDENTIFIER: US 6268481 B1
** See image for Certificate of Correction **
TITLE: Covalently coupled troponin complexes

Detailed Description Text (30):
Anti-microbial and anti-fungal agents may be added to prevent growth and may include those commonly found in the prior art at the concentrations found in the prior art such as gentamycin, clortrimazole, sodium azide, mycostatin, thimerosal, Kathon and/or Proclin 300.

Other Reference Publication (26):
Jacobson, K. Bruce et al. "Partial Purification of an Oxygen Scavenging Cell Membrane Fraction for Use in Anaerobic Biochemical Reactions" Biotechnology and Applied Biochemistry (9) 368-379 (1987).

PGPUB-DOCUMENT-NUMBER: 20030138867
PGPUB-FILING-TYPE: new
DOCUMENT-IDENTIFIER: US 20030138867 A1

TITLE: Medium composition, method and device for selectively enhancing the isolation of anaerobic microorganisms contained in a mixed sample with facultative microorganisms

PUBLICATION-DATE: July 24, 2003

INVENTOR-INFORMATION:

NAME	CITY	STATE	COUNTRY
Copeland, James C.	Ashland	OH	US
Myers, Kathy J.	Mansfield	OH	US

APPL-NO: 10/007739 [PALM]
DATE FILED: November 8, 2001

RELATED-US-APPL-DATA:
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INT-CL: [07] G01 N 33/554, G01 N 33/569, C12 Q 1/04

US-CL-PUBLISHED: 435/7.32
US-CL-CURRENT: 435/7.32

REPRESENTATIVE-FIGURES: NONE

ABSTRACT:

The present invention is directed to a medium, broth or agar, and a method of utilizing the same, in order to isolate and/or identify anaerobes from a mixed sample that contains facultative microorganisms. The medium contains an inhibitor of the electron transport system, such as a salt of azide (N.sub.3.sup.-), cyanide (CN.sup.-) or related compounds. These inhibitors are present in an amount sufficient to limit the growth of facultative microorganisms under anaerobic conditions while not inhibiting the growth of the anaerobe microorganisms. Preferably, the inhibitor is present in the amount of from about 0.1 mg/ml to about 1.0 mg/ml in broth medium, and from about 0.01 mg/ml to 1.0 mg/ml in agar medium.

[0001] The present application claims the benefit of priority to U.S. Provisional Application Serial No. 60/246,872 filed on Nov. 8, 2000.

20050197397. 11 Feb 05. 08 Sep 05. Method and composition for treating mammalian diseases and injuries caused by the over-expression of peroxynitrite. Martin, Alain. 514/557; A61K031/19.

☐ 2. 20050173245. 06 Apr 04. 11 Aug 05. Membrane suitable for use in an analyte sensor, analyte sensor, and associated method. Feldman, Benjamin, et al. 204/403.01; G01N027/26.

☐ 3. 20050131119. 27 Dec 04. 16 Jun 05. Enhanced lubrication in polyolefin closure with polyolefin grafted cyclodextrin. Wood, Willard E.. 524/210; 428/35.7 B65D001/00 C08K005/20.

☐ 4. 20050129680. 14 Nov 03. 16 Jun 05. Antimicrobial activity of antibodies. Wentworth, Paul, et al. 424/141.1; 424/164.1 424/178.1 424/600 530/388.4 530/391.1 A61K039/40 A61K033/00.

☐ 5. 20050123628. 03 Dec 03. 09 Jun 05. Compositions and methods useful for treating and preventing chronic liver disease, chronic HCV infection and non-alcoholic steatohepatitis. Zabrecky, George. 424/725; 424/757 514/18 514/33 514/440 514/458 514/474 A61K038/05 A61K031/704 A61K031/385 A61K031/355.

☐ 6. 20050072971. 28 Sep 04. 07 Apr 05. Organic diodes and materials. Marrocco, Matthew L. III, et al. 257/40; 257/E51.004 257/E51.01 257/E51.028 257/E51.043 257/E51.05 H01L029/08.

☐ 7. 20040172688. 12 Mar 04. 02 Sep 04. Intein-mediated protein splicing. Yadav, Narendra S., et al. 800/288; 435/320.1 435/419 435/69.1 A01H001/00 C12N015/82 C12N005/04.

☐ 8. 20040157280. 14 Nov 03. 12 Aug 04. Antibody mediated ozone generation. Wentworth, Paul, et al. 435/7.92; 424/600 A61K033/00 G01N033/53 G01N033/567 G01N033/537 G01N033/543.

☐ 9. 20040132638. 11 Aug 03. 08 Jul 04. No-modified hemoglobins and uses therefor. Stamler, Jonathan S., et al. 514/6; A61K038/42.

☐ 10. 20040117874. 14 Oct 03. 17 Jun 04. Methods for accumulating translocated proteins. Yang, Jianjun. 800/287; 435/419 435/468 435/69.1 A01H001/00 C12N015/82 C12N005/04.

☐ 11. 20040116350. 19 Dec 03. 17 Jun 04. Methods and compositions relating to hydrogen peroxide and superoxide production by antibodies. Wentworth Jr, Paul, et al. 514/18; 424/450 424/94.4 514/27 514/440 514/456 514/474 514/731 A61K038/44 A61K038/05 A61K031/385 A61K009/127 A61K031/05.

☐ 12. 20040058902. 09 Jun 03. 25 Mar 04. Substituted porphyrins. Batinic-Haberle, Ines, et al. 514/185; 514/410 540/145 A61K031/555 C07D487/22 A61K031/409.

☐ 13. 20040039366. 20 Aug 03. 26 Feb 04. Injectable pharmaceutical suspension in a two-chamber vial. MacLeod, Steven K.. 604/416; 604/82 A61B019/00.

☐ 14. 20040019031. 09 Jun 03. 29 Jan 04. Oxidant scavengers. Crapo, James D., et al. 514/185; 514/333 514/410 540/145 C07D487/22 A61K031/555 A61K031/444 A61K031/409.

☐ 15. 20030235571. 18 Jun 03. 25 Dec 03. Systemic treatment of pathological conditions resulting from oxidative stress and/or redox imbalance. Gojon-Romanillos, Gabriel. 424/94.1; 424/452 424/706 514/3 514/54 514/554 514/567 514/568 514/62 514/642 A61K038/28 A61K031/737 A61K038/43 A61K031/205 A61K009/48 A61K031/198 A61K031/19 A61K033/04 A01N033/12.

☐ 16. 20030233670. 04 Dec 02. 18 Dec 03. Gene sequences and uses thereof in plants. Edgerton, Michael D., et al. 800/278; 435/200 435/320.1 435/419 435/6 435/69.1 536/23.2 A01H001/00 C12N015/82 C12Q001/68 C07H021/04 C12N009/24 C12P021/02.

☐ 17. 20030167533. 31 Jan 03. 04 Sep 03. Intein-mediated protein splicing. Yadav, Narendra S., et al. 800/288; 435/183 435/468 A01H001/00 C12N015/82 C12N009/00.

☐ 18. 20030149090. 05 Nov 02. 07 Aug 03. Compositions for the treatment of infectious diseases. Gehlsen, Kurt R., et al. 514/400; 514/419 A61K031/4172 A61K031/405.

☐ 19. 20030138867. 08 Nov 01. 24 Jul 03. Medium composition, method and device for selectively enhancing the isolation of anaerobic microorganisms contained in a mixed sample with facultative microorganisms. Copeland, James C., et al. 435/7.32; G01N033/554 G01N033/569 C12Q001/04.

☐ 20. 20030008300. 23 Oct 01. 09 Jan 03. Red blood cells loaded with S-nitrosothiol and uses therefor. Stamler, Jonathan S., et al. 435/6; C12Q001/68.

☐ 21. 20020164379. 28 Feb 02. 07 Nov 02. Oxygen-containing ophthalmic composition. Nishihara, Toru, et al. 424/600; A61K033/00.

☐ 22. 20020142422. 12 Dec 00. 03 Oct 02. Moss genes from physcomitrella patens encoding proteins involved in the synthesis of amino acids, vitamins, cofactors, nucleotides and nucleosides. Lerchl, Jens, et al. 435/189; 435/320.1 435/410 435/69.1 536/23.2 C12N009/02 C07H021/04 C12P021/02 C12N005/04.

☐ 23. 20020132359. 15 Mar 02. 19 Sep 02. Dispensing unit for oxygen-sensitive drugs. Waterman, Kenneth C.. 436/127; 422/102 422/58 422/99 435/287.6 436/136 436/138 G01N033/00.

☐ 24. 20020128182. 24 Jul 01. 12 Sep 02. Preserving a hemoglobin blood substitute with a transparent overwrap. Gawryl, Maria S., et al. 514/6; A61K038/42.

☐ 25. 20020115595. 22 Oct 01. 22 Aug 02. Bioconjugates and delivery of bioactive agents. Grissom, Charles B., et al. 514/6; 514/44 530/350 536/23.2 A61K048/00 A61K038/16 C07H021/04 C07K014/435.

☐ 26. 20020111294. 22 Oct 01. 15 Aug 02. Bioconjugates and delivery of bioactive agents. Grissom, Charles B., et al. 514/6; 424/43 514/44 A61K048/00 A61K051/00 A61K038/17 A61K009/00.

☐ 27. 20020049154. 22 Oct 01. 25 Apr 02. Bioconjugates and delivery of bioactive agents. Grissom, Charles B., et al. 514/6; 514/44 604/20 A61K038/16 A61K048/00 A61N001/30.

☐ 28. 20020045057. 02 Feb 01. 18 Apr 02. Stenoprophiluric matrices, and methods of making and using the same. Guritza, Dennis A.. 428/540; 427/2.1 428/541 428/543 435/243 435/41 523/122 523/124 523/177 523/442 523/458 C14C009/00 A61L002/00 B27K001/00 C12P001/00 C08L001/00 C08K003/00 C09J101/00 C08L063/00 C08K005/00 C09J201/00 C09J004/00 C08J003/00 C12N001/00 B32B009/04 B05D003/00.

☐ 29. 20020042407. 14 Jun 01. 11 Apr 02. Substituted porphyrins. Fridovich, Irwin, et al. 514/185; 514/410 540/145 A61K031/555 A61K031/409 C07D487/22.

☐ 30. 20020037839. 06 Aug 99. 28 Mar 02. NO-MODIFIED HEMOGLOBINS AND USES THEREFOR. STAMLER, JONATHAN S., et al. 514/6; 530/385 A61K038/16 C07K001/00 C07K014/00 C07K016/00 C07K017/00 A61K035/14.

☐ 31. 20010033878. 24 Jan 01. 25 Oct 01. Porphyrin containing lactic acid bacterial cells and use thereof. Geppel, Asger, et al. 426/7; 426/11 426/34 426/442 426/541 426/544 435/252.1 435/252.9 435/253.4 435/71.3 A23L001/00 A23B004/00 C12N001/20 C12P021/04 C12G001/00.

☐ 32. 6916799. 14 Jun 01; 12 Jul 05. Substituted porphyrins. Fridovich; Irwin, et al. 514/183; 514/184 514/185 540/145. C07D487/22 A61K031/409 A61K031/555 A61P011/06.

☐ 33. 6916471. 23 Oct 01; 12 Jul 05. Red blood cells loaded with S-nitrosothiol and uses therefor. Stamler; Jonathan S., et al. 424/93.73; 424/93.7. C12N005/06.

☐ 34. 6911427. 12 Jun 97; 28 Jun 05. No-modified hemoglobins and uses therefore. Stamler; Jonathan S.. 514/6; 514/832 530/385. A61K038/42 C07K014/805.

☐ 35. 6884773. 06 Feb 97; 26 Apr 05. Modified hemoglobins, including nitrosylhemoglobins, and uses thereof. Stamler; Jonathan S., et al. 514/6; 514/2 514/832 530/385 530/829. A61K038/42 C07K014/805.

☐ 36. 6855691. 15 Mar 96; 15 Feb 05. Methods for producing and using S-nitrosohemoglobins. Stamler; Jonathan S.. 514/6; 514/2 514/832 530/385 530/829 604/28. A61K038/42 C07K014/805.

☐ 37. 6790827. 22 Oct 01; 14 Sep 04. Bioconjugates and delivery of bioactive agents. Grissom; Charles B., et al. 514/6; 424/1.11 424/1.53 424/1.69 435/181 435/455 435/91.1 435/91.31 514/1 514/2 514/4 536/23.1 536/24.5. A61K038/16 A61K051/00 C12N011/06 C12P019/34 C07H021/04.

☐ 38. 6777237. 22 Oct 01; 17 Aug 04. Bioconjugates and delivery of bioactive agents. Grissom; Charles B., et al. 435/455; 424/1.11 424/1.53 424/1.69 424/1.73 435/181 435/91.1 435/91.31 514/1 514/2 514/4 514/6 536/23.1 536/24.5. A61K051/00 A61K038/16 C12N011/06 C12P019/34 C07H021/04.

☐ 39. 6776976. 22 Oct 01; 17 Aug 04. Bioconjugates and delivery of bioactive agents. Grissom; Charles B., et al. 424/1.11; 424/1.53 424/1.69 424/1.73 435/91.1 435/91.31 514/1 514/2 514/4 514/6 536/23.1 536/24.5. A61K051/00 A61K038/16 C12P019/34 C07H021/02 C07H021/04.

☐ 40. 6627738. 06 Aug 99; 30 Sep 03. No-modified hemoglobins and uses therefor. Stamler; Jonathan S., et al. 530/385; 436/15 436/66. C07K014/805.

☐ 41. 6610832. 07 Jul 99; 26 Aug 03. Preserving a hemoglobin blood substitute with a transparent overwrap. Gawryl; Maria S., et al. 530/385; 604/403 604/408. C07K014/805 A61K019/02.

☐ 42. 6583132. 30 Nov 98; 24 Jun 03. Oxidant scavengers. Crapo; James D., et al. 514/185;. A61K031/555.

☐ 43. 6555228. 02 Feb 01; 29 Apr 03. Bio-supportive medium, and methods of making and using the same. Guritza; Dennis A.. 428/414; 106/14.05 424/78.09 428/411.1 428/413 428/423.1 428/447 428/457 428/480 428/523 428/537.1 523/122. B32B027/38 B32B009/04 A01N027/00.

☐ 44. 6315978. 22 Oct 99; 13 Nov 01. Bioconjugates and delivery of bioactive agents. Grissom; Charles B., et al. 424/1.53; 424/1.11 424/193.1 424/9.361 514/1 514/2 514/4 514/44 514/6. A61K051/00 A61K049/00 A61K039/385 A61B005/055 A01N061/00.

☐ 45. 6288027. 07 Jul 99; 11 Sep 01. Preserving a hemoglobin blood substitute with a transparent overwrap. Gawryl; Maria S., et al. 514/6; 530/385 604/403 604/408. C07K014/805 A61K019/02.

☐ 46. 6271351. 14 Oct 98; 07 Aug 01. Method for preserving a hemoglobin blood substitute. Gawryl; Maria S., et al. 530/385; 604/403 604/408. C07K014/805 A61B019/02.

☐ 47. 6268481. 22 Jul 97; 31 Jul 01. Covalently coupled troponin complexes. Morjana; Nihmat. 530/350; 436/811 436/86 530/841. A61K031/00.

☐ 48. 6203789. 12 Jun 97; 20 Mar 01. Red blood cells loaded with S-nitrosothiol and uses therefor. Stamler; Jonathan S., et al. 424/93.73; 424/93.7 435/372. C12N005/08.

☐ 49. 6197745. 20 Jun 96; 06 Mar 01. Methods for producing nitrosated hemoglobins and therapeutic uses therefor. Stamler; Jonathan S.. 514/6; 514/832 530/385 530/829. A61K038/16 C07K001/00.

☐ 50. 6153186. 15 Mar 96; 28 Nov 00. Red blood cells loaded with S-nitrosothiol and uses therefor. Stamler; Jonathan S., et al. 424/93.73; 424/93.7. C12N005/06.

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Term	Documents
$AZIDE	0
AZIDE	50717
IIIAAAZIDE	1
INAAAZIDE	1
ALPHAAZIDE	1
IAAZIDE	1
QUINONEDIAAZIDE	2
2-QUINONEDIAAZIDE	1
12-QUINONEDIAAZIDE	1
SULFOIAAZIDE	1
SUPPLY-N-IAAZIDE	1
(L12 AND ($AZIDE OR $CYANIDE)).PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	64

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Prev Page Next Page

51. 6150507. 10 Jul 98; 21 Nov 00. Method for producing a purified hemoglobin product. Houtchens; Robert A., et al. 530/385; 530/412 530/416. C07K001/18 C07K014/805.

☐ 52. 6127356. 07 Jun 96; 03 Oct 00. Oxidant scavengers. Crapo; James D., et al. 514/185; 252/399 252/400.23 435/189 435/252.3 435/320.1 540/145. A01N055/02 C07B047/00 C09K015/04 C09K015/32.

☐ 53. 5955581. 07 Jun 95; 21 Sep 99. Method for producing a stable polymerized hemoglobin blood-substitute. Rausch; Carl W., et al. 530/385; 530/380. C07K014/805.

☐ 54. 5753616. 07 Jun 95; 19 May 98. Method for producing a stable polymerized hemoglobin blood-substitute. Rausch; Carl W., et al. 514/6; 530/380 530/385. A61K038/42 C07K014/805.

☐ 55. 5691452. 07 Jun 95; 25 Nov 97. Method for preserving a hemoglobin blood substitute. Gawryl; Maria S., et al. 530/385; 604/408. C07K014/805.

☐ 56. 5633165. 25 May 95; 27 May 97. Fermentor with vertical shaft. Swartz; James R.. 435/287.1; 435/286.7 435/287.5 435/289.1. C12M001/06.

☐ 57. 5487980. 09 May 94; 30 Jan 96. Method of determining propensity of dissolved oxygen instability. Swartz; James R.. 435/29; 435/69.1. C12Q001/02.

☐ 58. 5352773. 16 Oct 92; 04 Oct 94. Stable hemoglobin based composition and method to store same. Kandler; Richard L., et al. 530/385;. C07K013/00 A61K035/14 A61K037/00 C07C103/52.

☐ 59. 5164110. 11 Oct 91; 17 Nov 92. Method of retarding corrosion of metal surfaces in contact with boiler water systems which corrosion is caused by dissolved oxygen. Haraer; Scott R., et al. 252/188.28; 252/387 252/389.62 252/390 252/392 422/16 422/17 562/437 564/282 564/290 564/306. C23F011/12 C23F011/14.

☐ 60. 5149441. 18 Oct 91; 22 Sep 92. Method of treating wastewater containing heat-curable (meth) acrylic monomer compositions. Welch, II; Edward K., et al. 210/719; 210/702 210/724 210/725 210/726 210/727 210/734 210/757 210/765 210/805. C02F001/70 C02F001/58 C02F001/56.

☐ 61. 5135663. 18 Oct 91; 04 Aug 92. Method of treating (meth)acrylic monomer-containing wastewater. Newberth, III; Frederick F., et al. 210/719; 210/702 210/724 210/725 210/726 210/727 210/734 210/757 210/765 210/805. C02F001/70 C02F001/58 C02F001/56.

☐ 62. 5091108. 21 Feb 91; 25 Feb 92. Method of retarding corrosion of metal surfaces in contact with boiler water systems which corrosion is caused by dissolved oxygen. Harder; Scott R., et al. 252/188.28; 252/387 252/390 252/392 422/16 422/17. C23F011/12 C23F011/14.

☐ 63. 4414334. 07 Aug 81; 08 Nov 83. Oxygen scavenging with enzymes. Hitzman; Donald O.. 435/262; 426/12 426/7 435/190 435/281 435/938. C12N009/04 C10G032/00 C12R001/84.

☐ 64. US20030138867A. Medium composition for selective enhancement of anaerobes from a mixed sample with facultative microorganisms, comprises a nutrient medium and a salt of azide. COPELAND, J C, et al. C12Q001/04 G01N033/554 G01N033/569.

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Term	Documents
$AZIDE	0
AZIDE	50717
IIIAAAZIDE	1
INAAAZIDE	1
ALPHAAZIDE	1
IAAZIDE	1
QUINONEDIAAZIDE	2
2-QUINONEDIAAZIDE	1
12-QUINONEDIAAZIDE	1
SULFOIAAZIDE	1
SUPPLY-N-IAAZIDE	1
(L12 AND ($AZIDE OR $CYANIDE)).PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	64

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Prev Pag

DOCUMENT-IDENTIFIER: US 5633165 A
TITLE: Fermentor with vertical shaft

Detailed Description Text (50):
All bacteria, including both archaebacteria and eubacteria, generally have more than one terminal oxidase (Anraku and Gennis, supra), and thus all except obligate anaerobes are potentially susceptible to DO.sub.2 instabilities upon culturing. Suitable bacteria for this purpose include aerobic and facultative anaerobic bacteria, whether archaebacteria and eubacteria, especially eubacteria, and most preferably Enterobacteriaceae. Examples of useful bacteria include Escherichia, Enterobacter, Azotobacter, Erwinia, Bacillus, Pseudomonas, Klebsiella, Proteus, Salmonella, Serratia, Shigella, Rhizobia, Vitreoscilla, and Paracoccus. Suitable E. coli hosts include E. coli W3110 (ATCC 27,325), E. coli 294 (ATCC 31,446), E. coli B, and E. coli X1776 (ATCC 31,537). These examples are illustrative rather than limiting. Mutant cells of any of the above-mentioned bacteria may also be employed. It is, of course, necessary to select the appropriate bacteria taking into consideration replicabilityof the replicon in the cells of a bacterium. For example, E. coli, Serratia, or Salmonella species can be suitably used as the host when well known plasmids such as pBR322, pBR325, pACYA177, or pKN410 are used to supply the replicon.

Detailed Description Text (68):
It has been found herein that when the organism has previously been induced for the presence of menaquinone and the cytochrome d oxidass complex, it has the ability to scavenge low concentrations of oxygen but does so inefficiently. When sufficient oxygen is present, it would appear that this inefficient pathway is not allowed to function.

Other Reference Publication (20):
Doelle and Hollywood, "Transitional Steady-State Investigations during Aerobic-Anaerobic Transition of Glucose Utilization by Escherichia coli K-12" European Journal of Biochemistry 83:479-484 (1978).

Other Reference Publication (32):
Harrison and Loveless, "The Effect of Growth Conditions on Respiratory Activity and Growth Efficiency in Facultative Anaerobes Grown in Chemostat Culture" J. Gen. Microbiology 68:35-43 (1971).

Other Reference Publication (71):
Tamura-Lis and Webster, "Cyanide- and Carbon Monoxide-Resistant Mutants of Vitreoscilla: Altered Cytochromes and Respiratory Properties" Arch. Biochem. and Biophys. 244(1):285-291 (1986).

Other Reference Publication (72):
Tamura-Lis and Webster, "Respiration in Carbon Monoxide and Cyanide Resistant Strains of Vittreoscilla" Fed. Proc. (Ab. #2799) 41(3):749 (1982).

L16: Entry 73 of 75 File: USPT Feb 7, 1984

DOCUMENT-IDENTIFIER: US 4430427 A
TITLE: Red absorbing combination of alcohol oxidase and an azide compound

Abstract Text (1):
Combining active alcohol oxidase with sufficient amount of an azide compound has been found to form a red absorbing combination. Formation of the red absorbing combination enables determining the presence of active alcohol oxidase by adding the azide compound to a preparation and observing the resultant color. Additionally, alcohol oxidase may be purified by adding the azide compound to a preparation containing active alcohol oxidase in an amount effective to produce a red absorbing complex and separating the red absorbing complex from the preparation.

Brief Summary Text (17):
According to the invention is a composition of matter comprising alcohol oxidase and an azide compound. Further according to the invention is a method of determining the presence of active alcohol oxidase by adding an azide compound, if such a compound is not present, and observing the resulting color. Further according to the invention is a method of purifying alcohol oxidase comprising making an enzyme preparation comprising alcohol oxidase, adding an azide compound to form a light absorbing combination with the alcohol oxidase, and separating the light absorbing combination from the rest of the enzyme preparation.

Brief Summary Text (19):
According to the invention there is provided a composition of matter comprising an azide having the characteristic formula R"(N.sub.3).sub.x, where R" may be a metal atom, a hydrogen atom, the ammonium radical, a complex, and the like, and an enzyme preparation comprising alcohol oxidase.

Brief Summary Text (20):
As indicated, the azide can be any azide which combines with alcohol oxidase to produce a new specifically absorbing species. Preferred azides are the metal salts of azides, particularly the electropositive metal azides which are not explosive. Particularly preferred are metal azides selected from Group 1A of the Periodic Table according to Mendeleev, such as lithium azide, sodium azide, potassium azide, and the like.

Brief Summary Text (36):
The azide compound is added to the alcohol oxidase preparation in an amount effective to produce an absorbance change preferably observed at 522 nm (broadly observed at 300-650 nm) in the presence of active enzyme. The amount of azide to be added can be readily determined by the artisan. Broadly, however, the azide can range from about 1 mole azide (N.sub.3.sup.-) per mole enzyme to about 5.times.10.sup.7 moles azide (N.sub.3.sup.-) per mole enzyme where the lower limit is an amount effective to give a detectable change in absorbance at, for example, 522 nanometers and the upper limit is determined by solubility of the azide (N.sub.3.sup.-) in water. Preferably, the azide is present in an amount in excess of that required to saturate the binding sites of the enzyme, i.e., above about 8 moles azide per mole enzyme as shown in Example XII, for maximum color development. Most preferably the azide is present in an amount in the range of about 10 moles

azide to about 2000 moles azide per mole enzyme.

Brief Summary Text (37):
The amount of azide can also be expressed in weight/weight terms if the molecular weight of the enzyme is known. For the alcohol oxidase isolated from Pichia pastoris described herein and having an estimated molecular weight of about 625,000, the azide can be added broadly in an amount in the range of about 0.07 mg to about 80,000 mg per gram alcohol oxidase, more preferably above about 0.1 mg per gram alcohol oxidase, most preferably in the range of about 0.7 mg to about 135 mg azide per gram alcohol oxidase.

Brief Summary Text (38):
The amount of azide to be added can also be expressed in terms of the enzyme activity and this may be particularly convenient when dealing with crude preparations. In the instance of the alcohol oxidase having a specific activity of 10-12 E.U. (enzyme units) per milligram of alcohol oxidase, the azide can be broadly in the range of from about 7.times.10.sup.-6 mg to about 8 mg azide (N.sub.3.sup.-) per Enzyme Unit, preferably above about 7.times.10.sup.-5 mg azide (N.sub.3.sup.-)/EU, most preferably in the range of about 7.times.10.sup.-4 mg azide (N.sub.3.sup.- /EU to about 1.35.times.10.sup.-2 mg azide (N.sub.3.sup.-)/EU. By an enzyme unit (EU) as used herein is meant the amount of enzyme required to oxidize 1 .mu.mole MeOH in one minute. Correlative ranges for other alcohol oxidases having other specific activities can be readily determined by the artisan.

Brief Summary Text (40):
As indicated, the invention also comprises methods of purifying alcohol oxidase comprising preparing an enzyme preparation comprising alcohol oxidase, adding an azide compound effective to form a light absorbing combination with the alcohol oxidase, and separating the light absorbing combination from the rest of the enzyme preparation. The enzyme preparation can be prepared by any suitable preparative method such as, for example, those set forth above. The azide can be added also as set forth above. The separating step can use any suitable procedure for separating the red absorbing combination from the other components present in the crude preparation. The red absorbing combination can be removed, for example, (1) by differential solubility using, for example, ammonium sulfate or polyethylene glycol; (2) by specific precipitation; (3) by column chromatography; (4) by preparative electrophoresis; (5) by preparative ultracentrifugation; (6) by any other enzyme preparative method known to the artisan; or (7) by dialysis to crystallization as herein described. Other suitable methods can also be employed by the artisan. Particularly preferred are those methods such as column chromatography, electrophoresis and the like where the color absorbing complex can facilitate recovery of purified protein.

Detailed Description Text (26):
This example demonstrates the color-forming interaction of alcohol oxidase with sodium azide. Color is observed within a few seconds, and persists.

Detailed Description Text (29):
Fermentation effluent from the aerobic fermentation of Hansenula polymorpha (prepared as described in Example II) was adjusted to pH 7.5 with concentrated ammonium hydroxide. Sample was homogenized and disrupted on a Dyno-Mill Model KDL using a 0.6 L vessel in a continuous operation at 30.degree. C. using belt combination #3 and a flow of 20-30 mL/hr. The beads were lead-free glass beads with a diameter of 0.3-0.5 mm. The resulting homogenate was centrifuged for 20 minutes at 10,000.times.g to yield a cell-free supernatant. The material thus prepared exhibited a specific activity of 4.9 (when analyzed by the dye-peroxidase method described in Example I), and gave a red color when treated with sodium azide as follows:

Detailed Description Text (34):
Hansenula polymorpha cell homogenate (prepared as described in Example II) (150 mL) is dialyzed against water to remove salts and other low molecular weight materials, then subjected to sequential protein precipitation by treatment with increasing amounts of polyethylene glycol (PEG) with a molecular weight of 6000. Sample is allowed to settle for 15 minutes after addition of PEG, then centrifuged at 12,000.times.g for 30 minutes. The resultant pellet is resuspended in 150 mL standard phosphate buffer (pH -7.5) and assayed for alcohol oxidase activity as described in Example I and color formation upon addition of sodium azide crystals. The supernatant liquid is treated with additional PEG for 15 minutes, and so on, as above. The results are shown in Table 5A:

Detailed Description Text (36):
This example demonstrates that a qualitative correlation exists between alcohol oxidase activity in different fractions and the formation of red color in the presence of azide ion.

Detailed Description Text (40):
This example demonstrates that treatment to denature the enzyme alcohol oxidase to produce inactive alcohol oxidase causes loss of the enzyme-azide red color.

Detailed Description Text (43):
Into an anaerobic cuvette is placed 2.5 mL of purified Pichia alcohol oxidase (purified as described in Example I) with a few crystals of sodium azide (about 1 mg). The absorption spectrum is scanned from 350-550 nm, with particular attention to absorption maxima at 370-380 nm and 450-470 nm. This spectral region includes the absorption bands characteristic of the oxidized form of flavine adenine dinucleotide (FAD) cofactor (Scan 1). An excess of oxygen-free ethanol is then injected into the cuvette, and the sample is again scanned from 350-550 nm (Scan 2). The optical densities of the resultant absorption maxima at about 380 and 450 nm are tabulated below. There is a substantial decrease in the absorption at the wavelengths characteristic of oxidized cofactor, FAD. The color of the sample changes from red to pale yellow upon introduction of ethanol. When oxygen is reintroduced to the enzyme-alcohol mixture by opening the cuvette to the air, the red color returns. The absorption spectrum is again recorded between 350-550 nm (Scan 3). The data are tabulated in Table 7A below.

Detailed Description Text (47):
Three mL of a purified Pichia alcohol oxidase solution containing about 7 mg/mL enzyme are placed in a cuvette with a 1 cm. pathlength. Sample is then scanned from 350-550 nm (Scan 1). To the sample, in the absence of air, is added 1 .mu.L ethanol. Sample is then scanned again (Scan 2). Maintaining the sample in the absence of air, several crystals (about 1 mg) of sodium azide are mixed with the alcohol-enzyme solution, which is scanned from 350-550 nm again (Scan 3). The cuvette is then opened to the air and stirred. Red color appears for a few seconds, but does not persist for sufficient time to allow a complete scan. Sample simply reverts to the pale yellow observed before air is introduced. Scan 4 records the sample after exposure to air. The results are tabulated in Table 7B.

Detailed Description Text (59):
Since the specific activity of Pichia pastoris alcohol oxidase is known to be 10-12 EU/mg (see Example I), the above data indicate a lower limit of about 0.3 mg alcohol oxidase/mL for visual detection (by eye) of alcohol oxidase by red color formation in the presence of sodium azide.

Detailed Description Text (62):
In a typical application of the red complex of alcohol oxidase-sodium azide, Pichia alcohol oxidase is tested for denaturation by a variety of inorganic salts, as described below. A few drops of crude enzyme (crude homogenate prepared as described in Example I) are placed on a spot plate. Then, sufficient salt crystals

were added to produce a saturated solution. Samples were assayed 1-2 minutes later for color formation and for enzyme activity as described in Example I. The results are tabulated in Table X.

Detailed Description Text (76):
Since about 7.6 moles of azide were found to bind with each mole of enzyme, this example suggests, within experimental error, that one azide molecule binds to each alcohol oxidase subunit.

Detailed Description Text (77):
As thus set forth above in illustrative embodiments and examples, it has been found that active alcohol oxidase changes color upon addition of azide compounds. The color changes are characteristic of the state of the enzyme and a red color is characteristic of active enzyme and is not characteristic of inactive enzyme. This unique color marker makes purification and visual estimation of activity and enzyme concentration very convenient. The invention is not to be limited by the illustrative embodiments and examples herein provided, however, but by the claims appended hereto.

CLAIMS:

1. A composition of matter comprising active alcohol oxidase; and

an azide compound selected from the group of compounds having the formula R"(N.sub.3).sub.x wherein R" is a metal atom, a hydrogen atom, or the ammonium radical, and N.sub.3 is the moiety N.dbd.N.dbd.N,

the azide compound being present in an amount effective to form a red absorbing combination with active alcohol oxidase.

3. A composition as in claim 1 wherein:

the azide is present in an amount in the range of about 1 mole azide/mole alcohol oxidase to about 5.0.times.10.sup.7 moles azide/mole alcohol oxidase.

4. A composition as in claim 1 wherein:

the azide is present in an amount in the range of about 8 moles azide/mole alcohol oxidase to about 5.0.times.10.sup.7 moles azide/mole alcohol oxidase.

5. A composition as in claim 1 wherein:

the azide is present in an amount in the range of about 10 moles azide/mole alcohol oxidase to about 2000 moles azide/mole alcohol oxidase.

6. A composition as in claim 1 wherein:

the alcohol oxidase is isolated from genus Pichia; and

the azide is present in an amount in the range of about 0.07 mg azide/gram alcohol oxidase to about 80,000 mg azide/gram alcohol oxidase.

7. A composition as in claim 1 wherein:

the alcohol oxidase is isolated from genus Pichia; and

the azide is present in an amount in the range of about 0.1 mg azide/gram alcohol oxidase to about 80,000 mg azide/gram alcohol oxidase.

8. A composition as in claim 1 wherein:

the alcohol oxidase is isolated from genus Pichia; and

the azide is present in an amount in the range of about 0.7 mg azide/gram alcohol oxidase to about 135 mg azide/gram alcohol oxidase.

12. A method of purifying an active alcohol oxidase comprising:

adding an azide compound selected from the group of compounds having the formula R"(N.sub.3).sub.x wherein R" is a metal atom, a hydrogen atom, or the ammonium radical, and N.sub.3 is the moiety N.dbd.N.dbd.N to a preparation comprising the active alcohol oxidase in an amount effective for producing a red absorbing complex; and separating the red absorbing complex from the preparation.

13. A method as in claim 12 wherein adding an azide comprises:

adding an amount of sodium azide in the range of about 1 mole azide/mole alcohol oxidase to about 5.0.times.10.sup.7 moles azide/mole alcohol oxidase.

14. A method as in claim 12 wherein adding an azide comprises:

adding an amount of sodium azide in the range of about 8 moles azide/mole alcohol oxidase to about 5.0.times.10.sup.7 moles azide/mole alcohol oxidase.

15. A method as in claim 12 wherein adding an azide comprises:

adding an amount of sodium azide in the range of about 10 moles azide/mole alcohol oxidase to about 2000 moles azide/mole alcohol oxidase.

16. A method as in claim 12 wherein adding an azide comprises:

adding an amount of sodium azide in the range of about 0.07 mg azide/gram alcohol oxidase to about 80,000 mg azide/gram alcohol oxidase; and wherein

the alcohol oxidase is isolated from genus Pichia.

17. A method as in claim 12 wherein adding an azide comprises:

adding an amount of sodium azide in the range of about 0.1 mg azide/gram alcohol oxidase to about 80,000 mg azide/gram alcohol oxidase; and wherein

the alcohol oxidase is isolated from genus Pichia.

18. A method as in claim 12 wherein adding an azide comprises:

adding an amount of sodium azide in the range of about 0.7 mg azide/gram alcohol oxidase to about 135 mg azide/gram alcohol oxidase; and wherein

the alcohol oxidase is isolated from genus Pichia.

28. A method of determining the presence of active alcohol oxidase comprising:

observing the color of a composition of matter comprising an alcohol oxidase and an azide compound selected from the group of compounds having the formula R"(N.sub.3).sub.x wherein R" is a metal atom, a hydrogen atom, or the ammonium radical, and N.sub.3 is the moiety

N.dbd.N.dbd.N

the azide compound being present in an amount effective to form a red absorbing

combination with active alcohol oxidase.

Previous Doc Next Doc Go to Doc#

Am J Physiol. 1983 Mar;244(3):R356-62.

Atlantic hagfish cardiac muscle: metabolic basis of tolerance to anoxia.

Hansen CA, Sidell BD.

Oxygen tensions in the major venous inputs to the systemic and portal-vein hearts of normoxic Atlantic hagfish (12.3 +/- 1.7 and 11.0 +/- 1.6 mmHg, respectively) are low compared with typical vertebrate values. Anoxia and poisoning with cyanide and azide do not significantly affect in situ performance of the systemic heart. Idoacetate poisoning, however, results in a significant decrease in cardiac performance of the systemic heart to 12% of the initial value after 3 h. Activities of mitochondrial enzymes of hagfish ventricle suggest a small potential for aerobic metabolism compared with those in the aerobic ventricle of Atlantic cod. Activities of enzymes of carbohydrate metabolism indicate similar anaerobic capacity in hagfish and cod ventricle. The ratio of pyruvate kinase to cytochrome c oxidase, an index of anaerobic to aerobic capacity, is 5.6 times greater in hagfish than cod ventricle. Metabolite concentrations in freeze-clamped ventricles of normoxic and hypoxic hagfish indicate hypoxia-induced activation of glycogenolysis, enhanced substrate flow across 6-phosphofructokinase, and an apparent secondary constriction of glycolysis at the level of glyceraldehyde-phosphate dehydrogenase. Carbohydrate utilization via the glycolytic pathway appears essential for maintenance of cardiac performance in both normoxic and anoxic hagfish. Under conditions of severe hypoxia, ATP provision is probably met by anaerobic glycolysis.

PMID: 6299122 [PubMed - indexed for MEDLINE]

Am J Physiol. 1993 Apr;264(4 Pt 1):C961-7.

Mitochondria as a source of reactive oxygen species during reductive stress in rat hepatocytes.

Dawson TL, Gores GJ, Nieminen AL, Herman B, Lemasters JJ.

Department of Cell Biology and Anatomy, School of Medicine, University of North Carolina, Chapel Hill 27599-7090.

Cell killing, oxygen consumption, and hydroperoxide formation were determined in rat hepatocytes after glycolytic and respiratory inhibition. These conditions model the ATP depletion and reductive stress of anoxia ("chemical hypoxia"). Glycolysis was inhibited with iodoacetate, and mitochondrial electron transfer was blocked with sodium azide, cyanide, or myxothiazol. Cell killing, hydroperoxide formation, and inhibitor-insensitive oxygen consumption were greater after azide than after myxothiazol or cyanide. Desferrioxamine, an inhibitor of iron-catalyzed hydroxyl radical formation, delayed cell killing after each of the respiratory inhibitors. Anoxia also delayed cell killing during chemical hypoxia. However, during anoxic incubations, desferrioxamine did not delay the onset of cell death. These findings indicate that reactive oxygen species participate in lethal cell injury during chemical hypoxia. In isolated mitochondria, previous studies have shown that myxothiazol inhibits Q cycle-mediated ubisemiquinone formation in complex III (ubiquinol-cytochrome c oxidoreductase) and that ubisemiquinone can react with molecular oxygen to form superoxide. Decreased killing of hepatocytes with myxothiazol compared with azide suggests, therefore, that mitochondrial oxygen radical formation by complex III is involved in cell killing during reductive stress. In support of this hypothesis, myxothiazol reduced rates of cell killing and hydroperoxide formation in hepatocytes incubated with azide or cyanide. This mitochondrial mechanism for oxygen radical formation may be important in relative but not absolute hypoxia.

PMID: 8386454 [PubMed - indexed for MEDLINE]

Eur J Biochem. 1993 Apr 1;213(1):563-71. Related Articles, Links

Enzymes of anaerobic metabolism of phenolic compounds. 4-Hydroxybenzoyl-CoA reductase (dehydroxylating) from a denitrifying Pseudomonas species.

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Angewandte Mikrobiologie, Universitat Ulm, Germany.

The reductive removal of aromatic hydroxyl functions plays an important role in the anaerobic metabolism of many phenolic compounds. We describe a new enzyme from a denitrifying Pseudomonas sp., 4-hydroxybenzoyl-CoA reductase (dehydroxylating), which reductively dehydroxylates 4-hydroxybenzoyl-CoA to benzoyl-CoA. The enzyme plays a role in the anaerobic degradation of phenol, 4-hydroxybenzoate, p-cresol, 4-hydroxyphenylacetate, and other aromatic compounds, of which 4-hydroxybenzoyl-CoA is an intermediate. The enzyme is therefore induced only under anoxic conditions with these aromatic substrates, but not with benzoate or under aerobic conditions. A similar enzyme which reductively dehydroxylates 3-hydroxybenzoyl-CoA is induced during anaerobic growth with 3-hydroxybenzoate. The soluble enzyme 4-hydroxybenzoyl-CoA reductase was purified. It has a molecular mass of 260 kDa and consists of three subunits of 75, 35, and 17 kDa. The subunit composition is likely to be a2b2c2. The enzyme contains 12 mol iron/mol and 12 mol acid-labile sulfur/mol and exhibits a typical ultraviolet/visible spectrum of an iron-sulfur protein. The reaction requires a reduced electron donor such as reduced viologen dyes; no other co-catalysts are required, the product is benzoyl-CoA and oxidized dye. The reductase is rapidly inactivated by oxygen. The inactivation by low concentrations of cyanide or azide in a pseudo-first-order time course suggests that it may contain a transition metal in an oxidation state which reacts with these ligands. 4-Hydroxybenzoyl-CoA reductase represents a type of enzyme which is common in anaerobic aromatic metabolism of phenolic compounds. A similar enzyme is demonstrated in Rhodopseudomonas palustris anaerobically grown with 4-hydroxybenzoate. The biological significance of reductive dehydroxylation of aromatics and a possible reaction mechanism similar to the Birch reduction are discussed.

PMID: 8477729 [PubMed - indexed for MEDLINE]